

Firestone

INTEROFFICE

NOVEMBER 12, 1975

TO MR. C. J. KLEINERT

FROM C. W. ENGBLOM

REFERRING TO LETTER OF

SUBJECT

VINYL CHLORIDE SAFETY ASSOCIATION MEETING
OCTOBER 30-31, 1975 - HOUSTON, TEXAS

RECEIVED

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Mr. W. W. Madden and I attended the meeting. Seventy-five people from thirty-five facilities were there. A list of those in attendance is attached.

1. Pilot Plant Problems: A. A. Peterson, Union Carbide Corp.

Mr. Peterson described typical problems encountered by a Pilot Plant located within or in close proximity to a production complex. VC emissions from the manufacturing unit naturally affect their operation and vice versa. He also claimed that not enough attention is given to safety or medical considerations when handling new raw materials (solvents, catalysts, etc.) not used in production.

To avoid set-ups, Air Products polymerizes the first Pilot Plant scaleup of a research recommendation to only 30% conversion and vents. Union Carbide has eliminated much of their sampling of Pilot Plant batches.

Everyone has area monitoring of their Pilot Plants. No one plans to shutdown their Pilot Plant but several have suspended operations for varying amounts of time. Air Products plans to move their Pilot Plant outside the production unit. Stauffer wants to install a monomer recovery system for their Pilot Plant, however others appear to be content to vent their steam jet exhausts through extended stacks.

2. Large Coverage Insurance Problems: John Barr, Air Products.

Since the merger of FIA and OIA, property damage and business interruption coverage has been limited to approximately \$15 million. Air Products is in the planning stage for a large reactor plant and this ruling has the effect of limiting plant capacity. Panasote, Passaic, New Jersey, are having similar problems and are also required to report emergencies to FIA. They feel this is partially due to their location in a densely populated urban area.

Five companies are totally self-insured, and several others had some form of partial self-insurance. Mr. Barr discussed the possible formation of a mutual protection agency. The petroleum industry pools funds as a form of self-insurance - Oil Insurance Limited.

Many felt that this problem is not peculiar to the vinyl chloride industry. Others in the chemical industry are experiencing similar problems. FIA surveys show that 80% of chemical industry claims are caused by explosions.

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3. Corrosion Around Sight Glasses and Nozzles: Gl nn Schaaf, B. F. Goodrich.

Goodrich has observed stress corrosion cracking in a number of vessels constructed of type 304 and type 321 stainless steel; in passivated as well as in unpassivated vessels. The attack appears as a branched pattern of cracks which start at a weld area and extend into the unwelded plate material. None of the vessels in which stress corrosion cracking has been observed were cleaned by high pressure water until a considerable period of service had accumulated. No attack was seen on vessels with less than three years of service. A Goodrich paper detailing the problem is attached.

Four companies had similar reactor problems. Several people observed cracking in centrifuge bowls. Four facilities experienced stress corrosion cracking in process piping. One company observed cracking on vibrating screen frames. They are now using monel frames to eliminate the problem. One company x-rays their vessels every two years.

4. OSHA COMMENTS:

a. Citations

Stauffer Chemical, Delaware City, had an inspection last June and received two citations. The first was for failure to label scrap drums. The second was for exposing an operator in their Poly Building to 25 ppm without a mask. Stauffer took readings at the same time and obtained results of 1 ppm. The Poly Building was shutdown at the time. The second citation was subsequently dropped.

Dow Chemical, Midland, Michigan, had an incident in which two mechanics were exposed to liquid VC when disassembling a reciprocating compressor. They reported the incident to OSHA and were later cited for failure to provide respiratory protection and for exposing an employee to liquid vinyl chloride.

Goodyear, Niagara Falls, received a citation for exposing a compound operator to 1.4 ppm T.W.A. without a mask. The charge was subsequently dropped. Goodrich, Avon Lake, and Borden Chemical received similar citations which were later dropped. General Tire, Astabula, Ohio, were cited for exposing an operator to a 5 ppm T.W.A. without a respirator. The charge has not been dropped and a court challenge is pending.

Great American had an inspection and were cited for two non-serious violations involving poor housekeeping in the compound area and in a mask storage area.

b. VCM AREA MONITORING

Panasote, Passaic, New Jersey, has a 40 pt. Ecom infra-red system equipped with a Michelson interferometer. The interferometer makes the IR system 1,000 times more sensitive by eliminating interferences. Th monitoring system is tied to a Texas Instruments computer which calculates T.W.A. exposures for their 51 employees.

The computer is programmed to calculate T.W.A. based on continuously updated monitoring data, time studies on work habits, and dissipation rate information on vinyl chloride. They have a 99+% confidence level in the data generated as compared to personnel monitoring data obtained via charcoal tubes. They have petitioned OSHA for a variance to use this system to supplant personnel monitoring and feel they will receive a favorable response. Their annual personnel monitoring costs were estimated at \$50,000. A "ballpark" estimate of system cost was \$350,000. They plan to publish the results of their work shortly.

Two PVC producers felt they would be below a 1 ppm T.W.A. by April 1. Twenty-six believe they will be below a 5 ppm T.W.A. by April 1.

c. Deregulation of Areas

Hooker has a bagging area which is regulated only when bagging.

Continental Oil deregulates the VC loading rack when not loading.

Georgia Pacific is ready to deregulate the entire plant based on area and personnel monitoring. It is my understanding that they have a large reactor, open air, computer controlled plant.

d. Females in Plants - OSHA vs. EEO

Four companies don't allow women capable of having children to work in regulated areas. Twenty-three have females working in regulated areas.

e. Residual Monomer in Resin

Glenn Schaaf, Goodrich, presented a brief description of their stripping columns. Residual levels are running 0.1 to 1.0 ppm for porous homopolymer with no deterioration in final properties. Maximum throughput rate is 20,000 dry lbs./hr.

f. Availability of Canisters

The manufacture of charcoal canisters was not permitted after June 1, 1975, unless they had an end life indicator. The purchase of canisters without end life indicators is prohibited after January 1, 1976. Six companies claimed some of their employees are using canister masks below 25 ppm.

MSA turned in two models with end life indicators to NIOSH for approval, but were turned down because the color differential was not distinct enough. Scott also submitted a model that was rejected. MSA and Scott turned in combination masks (airline or canister) for approval. Both were rejected.

g. Massive Release

There were nearly as many definitions of "massive release" as companies in attendance. The only common denominator appears to be that no one

ti s their definition to a particular ppm level. Many people felt that reporting a massive release to OSHA invites a subsequent inspection.

5. EPA Considerations: Bill Madden, Firestone.

Bill described the recent meeting the SPI subtechnical committee had with EPA. The purpose of the gathering was to discuss EPA's latest document and recommend changes. Some of the changes discussed were in the following areas:

- a. Exclusion of Pilot Plants, research facilities, and possibly control labs from the provisions of the proposed standard;
- b. Change measurement sensitivity requirement for portable instruments to 5 ppm;
- c. Eliminate the requirement for having a rupture disc between a pressure vessel and its' relief valve;
- d. Allow manual vents;
- e. Allow venting of 25 gals. of vapor at S.T.P. from vessels other than reactors. EPA's current proposal permits venting 2% of the vessel volume;
- f. Reduce recordkeeping and product testing requirements.

Bill feels there is little chance of EPA bending on items 3 and 4.

6. Basic Safety: Pete Bogart, Tenneco

This talk was in response to a growing feeling of many within the organization that the association has strayed from its original mission of promoting safety in VC and PVC plants. He asked everyone to consider the following basic questions as they relate to their own organization.

- a. Do we put economics before safety especially as it relates to providing safe equipment (tools, ladders, etc.)?
- b. What provisions have we made for people to signal they are in trouble?
- c. Are emergency notification systems easy to use?
- d. Are people sufficiently trained to handle an emergency? Is emergency equipment adequate?
- e. What is the quality of treatment at local hospitals? Are they familiar with the chemicals we use?
- f. What is our criterion for allowing injured employees to return to work? Are we just interested in avoiding lost time accidents?
- g. How effective are our safety training programs?

The talk generated much discussion particularly about individual safety programs. These programs were many and varied but all seemed to contain some kind of employee suggestion system.

7. True Confessions

Diamond Shamrock, Deer Park, Texas had a fatality on October 1, 1975. The man was 22 years old with 2 years experience. His assignment that night was to drop finished batches from the reactors to the strippers. He was found by high pressure cleaners lying on the bottom of a 2,000

PVC reactor when they noticed a ladder in the reactor. The reactor had not been safed out for entry or ventilated for flushing. They have a fine ventilation system similar to ours in Pottstown. He was immediately rescued from the reactor by means of wrist manacles but was already dead. The rescue worker did not wear a respirator. An "O" ring and a flashlight were also found at the bottom of the vessel.

The coroner listed the official cause of death as asphyxia from vinyl chloride. He also had a skull fracture but no internal hemorrhaging. OSHA were notified and made an inspection. They later came back and took statements from the operators who had made depositions on the night of the incidents. OSHA then asked Diamond to simulate the reactor condition at the time of the incident. This was done and charcoal tube samples were taken for VCM analysis by OSHA and Diamond 2 feet below the manway opening and at the bottom of the reactor. Diamond found 1200 ppm two feet below the manway; the speaker did not know the result at the bottom. OSHA results were unknown at the time of the meeting.

Diamond held a corporate safety review and concluded that the man either fell off the ladder or fell through the manway probably trying to retrieve the "O" ring or flashlight. As a result of the review, several new safety measures have been instituted. High pressure flushers are required to wear safety belts with a short line attached to a post near the reactor. Anyone entering a vessel is equipped with an alarm device which he must acknowledge every three minutes to signal that he is alright. Diamond does not use manway attendants. Oxygen is now available in the control room and ladder lengths have been standardized.

Following the presentation, there was much discussion from the floor. Great American locks their manways with chains to prevent unauthorized vessel entry and only the lead operator has a key. Goodrich has a local horn system which the person in the reactor must acknowledge at certain time intervals by pulling a rope to indicate that he is O.K. If he doesn't, a general alarm sounds. Several others have modifications of the same system. Borden reported some incidents of sabotage of their horn system. Most companies require manway attendants. Some questioned the value of manway attendants since the job is boring and they tend to read or even sleep. Many facilities require the use of bump caps (similar to a baseball batting helmet) while in a reactor. John Barr, Air Products, commented that OSHA is reviewing vessel entry and safe out procedures.

Georgia Pacific reported a vinyl spill when transferring one sphere to another due to operator error. The vessel was hydrostaticed and the relief valve opened. Their computer printed out a high VC level alarm but no one understood the message.

Stauffer reported a catalyst chest explosion when apparently either SBP or IPP was stored in the wrong catalyst storage refrigerator. No one was injured.

Hooker reported that a man passed out when VC vapors somehow got into his mask. The vapors were coming from a vessel being filled with water. During his description, the Hooker representative mentioned that this

tank had a valv (locked open) between the vessel and the rupture disc. This sounds like a dangerous practice to me. His comments generated much debate about relief systems in general. Certain Teed, a large reactor plant, described a unique relief system. They have two separate relief lines each equipped with a valve under a rupture disc and relief valve. When one valve is opened, the other one is automatically closed. It seems to me such a system would require very careful surveillance.

The recent lost time accident at Perryville was described.

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